

NOTES

PROF. TACCHINI has been appointed Director of the Central Office of Meteorology and of the Observatory of the Collegio Romano.

WE are requested to announce that during the months of August and September, the apartments of the Geological Society will be closed on Saturdays at 2 o'clock in the afternoon.

WE are glad to hear that there is a likelihood of the late Prof. Rankine's papers being republished in a collected form. Mr. W. J. Millar, of Glasgow, has been asked to act as editor, and is at present drawing up a list of papers which it might be advisable to reprint.

THE French Association for the Advancement of Science will hold its next session at Montpellier, as we announced some time ago. One of the two lectures will be on the "Electric Light," of which there will be a splendid display. The meeting of the Association will take place on August 28, so that the great heat will be no obstacle to the excursions, which will be attractive, as every effort will be made to take advantage of the exceptional position of the city. Montpellier being one of the oldest universities in the world, a number of historical relics will be exhibited for the first time to strangers, of high interest in the development of science.

THE meeting of the Swiss Association of Naturalists will take place at St. Gallen on August 10-12 next. The committee invites foreign naturalists to attend the meeting. The detailed programme may be had upon application to the secretary, Herr Stein, at St. Gallen.

DURING the last days of June shocks of earthquake of moderate intensity were felt on the south-east side of Mount Etna, particularly in the vicinity of the little town of Zafferana. The great crater at the time was sending forth a mighty thick black column of smoke. On the southern slope of the mountain the earthworks for the erection of the great astronomical observatory, for which Prof. Tacchini drew the plans, have been begun. The observatory will stand at an elevation of 3,000 metres above the sea; the largest telescope will measure 33 centimetres in diameter. The Commission appointed by the Italian Government to study the phenomena accompanying the recent eruption, have proposed the establishment of a Cabinet for Vulcanology, of which Prof. O. Silvestri is to be the director.

THREE violent shocks of earthquake occurred at Athens on July 3 at 4.15 P.M. The centre of the oscillations seems to have been at Xylokastron, near Corinth. On Mount Parnassus and at Thebes the phenomenon was also noticed. At Athens another shock was felt on the 6th shortly after midnight.

MR. W. LANT CARPENTER describes in the *Bristol Mercury* a visit he recently paid to Mr. Edison's laboratory at Menlo Park. The laboratory, workshops, &c., he states, as well as some isolated buildings for delicate electrical measurements, are spread over an acre of ground, railed in, admission to which is only given to privileged visitors. While waiting for Mr. Edison, Mr. Carpenter was conducted by a messenger through all the physical, chemical, and private experimenting laboratories, and then through the workshops, the machinery of which is driven by a beautiful, high-pressure, eighty-horse engine, also used to drive the electric-light machinery, most of which is in the same shop. About a dozen workmen were engaged, some in electrical test measurements, &c., but chiefly in manufacturing Mr. Edison's latest form of telephone, constructed for the electric and hygrometric conditions of our English atmosphere. Mr. Edison admitted that he was not doing very much at present

at the problem of domestic electric lighting. He appeared to consider the question of its economical subdivision a solved problem (he had sixteen lamps in the workshop, each with its small coil of platinum wire, in a glass globe, three to four inches diameter), and was now giving attention to the details of lamp construction. This new form of lamp is to be a minute cylinder of compressed pure zircon, a rare earth allied to magnesia, which is to be heated to whiteness by the surrounding coil of platinum wire. A chemist was engaged in purifying zircon for this purpose. The newest thing in the shop was a dynamometer, the last and best of several invented by Mr. Edison, with the result of which he was perfectly satisfied, and he stated that with this instrument he had been able to show that, after deducting the necessary amount for friction in the machinery, more than 95 per cent. of the mechanical force employed was obtained in the form of light. Mr. Carpenter informs us that in consequence of a circular addressed by Mr. Edison to miners in Colorado (whence Mr. Carpenter has just returned) and elsewhere, platinum is being widely discovered in these districts, now attention is directed to it.

THE summer meeting of the Institution of Mechanical Engineers will be held in Glasgow, by the invitation of the Institution of Engineers and Shipbuilders in Scotland, commencing Tuesday, August 5. The following papers will be read and discussed:—"On the Pneumatic Marine Governor," by Mr. W. J. Dunlop, of Port Glasgow.—"On the 'Velometer' Governor," by Mr. F. W. Durham, of London.—"On the Maintenance of Constant Pressure in Water Service Pipes," by Mr. Stephen Alley, of Glasgow.—"On the Barton Water Regulator, or Reducing Valve," by Mr. W. H. Thomas, of London.—"On the Forging of Crank Shafts," by Mr. W. L. E. McLean, of Glasgow.—"On Water-pressure Engines with Variable Stroke," by Mr. John Hastie, of Greenock.—"On the Working of Traction Engines in India," by Mr. R. E. B. Crompton, of London.—"On the Construction and Working of a Vertical Action Steam Dredger," by Mr. R. B. Buckley, of the Public Works Department, Bengal.—"On Plate-rolling Machinery," by Mr. Edward Hutchinson, of Darlington.—"On Barton and West's Water Meter," by Mr. W. H. Thomas, of London. A number of interesting visits and excursions have been arranged.

WE are requested by the Committee of the Sunday Society to publish the following:—"Through the kindness of Sir Coutts Lindsay, the proprietor and director of the Grosvenor Gallery, the members of the Sunday Society have to-day (Sunday, July 27) been favoured with admission to the Summer Exhibition, between the hours of 6 and 8.30 P.M., and nearly 500 have availed themselves of the privilege. Next Sunday the Gallery will be opened to the public, free by tickets, which will be issued by the Society to all persons making written application and sending stamped and addressed envelope, for reply, to the Honorary Secretary, 19, Charing Cross, S.W. A special catalogue has been published by the Society, price 4d.; this must be obtained before Sunday, as no catalogues will then be on sale."

AN exhibition somewhat similar to the one we described at the Royal Aquarium, but on a larger scale, of plans, diagrams, models, apparatus, and all appliances illustrative of the various subjects that have to be considered in planning water-supplies, and the domestic arrangements for making them in the best way available, is to be held at the Alexandra Palace. The Exhibition will be arranged in fifteen sections as follows:—Section I. Physics and Chemistry; Section II. Rainfall, &c.; Section III. Rivers; Section IV. Geology and Hydro-Geology; Section V. Waterworks; Section VI. Distribution of Water; Section VII. Statistics; Section VIII. Water Examination; Section IX. Filtration; Section X. Hardness; Section XI. Disease; Section XII. Antiquarian; Section XIII. Pollution; Section XIV.

Literature; Section XV. Few people really know anything of the various considerations that are involved in selecting and maintaining a "pure" and sufficient water-supply, and the spread of some of the knowledge that has been obtained may help to remove many of the prejudices against improvements, and may show that low water-rates are perhaps not the only points that ratepayers should regard. Sections X. and XI. especially refer to matters of general interest too often overlooked. It is hoped that a permanent museum, to be located somewhere in London, may result from this exhibition. All communications for the Committee should be made to Mr. A. T. Atchison, 34, Great George Street, S.W., and applications for space and for information respecting the exhibition should be made to Mr. W. H. Jones, Manager, Alexandra Palace, N.

THE new (German) Geological Society of Metz has just published its first *Jahresbericht* (for 1878). Apart from the usual report of proceedings at the meetings, the publication contains an interesting paper by Capt. Schultzen on the old Roman aqueduct from Gorze to Metz.

THE death from apoplexy is announced of M. Louis Favre, the contractor for the St. Gothard Tunnel. He was 53 years of age, and had engaged in nine years to construct a tunnel nearly 15 kilomètres long through beds of granite, gneiss, and serpentine. Notwithstanding difficulties of all kinds, the work had been carried on interruptedly for six years, the estimate being so careful that there was no excess of outlay, and M. Favre expected in two years to complete the work.

WE have received from Mr. E. Paterson, of Bedford Court, Covent Garden, parts i. and ii. of an unusually well got up illustrated Catalogue of Electrical Apparatus manufactured by him. Not only is the Catalogue itself exceedingly full and drawn up with much intelligence, but in the second part some really useful practical information is given on the principles and fixing of electric signals, which, we daresay, will be welcome to many. We are sure many of our readers will find Mr. Paterson's Catalogue of considerable service.

THE Americans have stolen a march upon us in sanitary matters, as they have done in so many other things. In March of this year an Act passed the U.S. Congress organising a Board of Health to look after all matters relating to the public health, and to advise Congress what steps should be taken for the promotion of so all-important a matter. We have just received the first number of the weekly *National Board of Health Bulletin*, published by this body, who have 50,000 dollars appropriated to them for salaries and expenses. Besides mortality statistics the *Bulletin* contains a number of rules and regulations with respect to the sanitary condition of ships.

M. COULON, conservator of the Industrial Museum of Rouen, has discovered a new system for transforming sound into light, which phenomenon has been the subject of a lecture at the Salle des Capucines by M. Frank Gerald with the Gower telephone. Two Geissler tubes are put in quick rotation on an axis. The Ruhmkorf coil of the first is worked by an ordinary interruptor and gives the deviation of a luminous cross. The interruptor of the second is replaced by a telephone. The figure presented by the second tube projects on the first one, which is coloured by uranoxide glass and exhibits the most rapid changes according to the height of the note delivered in the telephone-trumpet. The sensibility of the changes are startling and most interesting. An exhaustive lecture by M. Coulon will be given at Rouen in a few days, and the apparatus exhibited at the Palais de l'Industrie.

DR. MOESTA has discovered the remains of an oak forest at a depth of 7 feet or 8 feet, near Rotenburg. The number of well-preserved trunks is enormous; one of them is 18 mètres long

and 1 mètre and a half in diameter. This bog oak will be used for carving.

THE twenty-fourth meeting of German and Austrian Apiculturists will be held at Prague on September 7-11, and will be accompanied by an international exhibition of living bees, and all products and apparatus connected with bee-culture.

THE second Congress of Austrian wine-growers will be held at Vienna on September 22-25, and will be accompanied by an exhibition of all products, apparatus, and implements connected with viticulture.

AT Roveredo a statue has been erected to the eminent philosopher and statesman, Antonio di Rosmini-Sarbatì (born 1797, died 1855). The work was executed by a Florentine sculptor, and the material is Carrara marble. The statue is said to be an excellent likeness.

PHYLOXERA is unfortunately making rapid progress in Savoy. Since July 1 no less than forty-two different vineyards in the cantons of Chambéry, Montmélard, Yenne, and Rochette have been attacked by the pernicious insect; the head-centre of the infection seems to be at Chambéry and at Montmélard.

HERR KARL RUSS, the eminent German ornithologist, is writing a new work on foreign domestic birds, in three volumes. Two are completed and part of the third has recently appeared. Herr Karl Rümpler, of Hanover, is the publisher.

THE Central School Depot publishes a clearly written and instructive penny tract—"A Few Interesting Facts about Light, simply Told, for Young People," by the Rev. F. J. C. Fenton. Mr. Fenton discards all technical terms, and conveys a wonderful amount of accurate elementary information in a few pages.

A JAPAN paper says that there is a prospect of a new coal mine being worked in Ishigari, in the island of Yezo, the resources of which are only now beginning to be gradually developed. Some foreign experts in the employ of the Kaitakushi, or Colonisation Department, which is doing good work in Yezo, have tested specimens of coal and found them to be of good quality and suitable for purposes of steam navigation. As the locality where the coal exists is at some distance from the coast, it is proposed to construct a railway from it to the sea-board, and a survey of the country for that purpose is now being proceeded with.

FROM a recent investigation of the electric arc by Professors Thomson and Houston (*Fourn. of Frank. Inst.*) it appears that the relations between arc resistance and current strength and between current strength and illuminating power, are expressed by the following laws:—(1) In arcs of equal lengths the resistances are inversely proportional to the current strengths; (2) The illuminating power of an arc is approximately proportional to the current traversing it; (3) In arcs of equal length the total energy given out is proportional to the current strength.

INTELLIGENCE has been received from Ceylon that the examination of supposed pearl-oyster banks on the east coast has not resulted in the discovery of any deposits worth fishing. The oysters found, though of the pearl kind, contained no pearls. It is supposed that they had been washed by currents from deep-sea banks in the Bay of Bengal.

UNDER date of April 30, a correspondent of the *North China Herald* at Wladivostock, in Russian Manchuria, writes that, although the mountain tops were still covered with snow, the winter had at length come to an end, the ice in the harbour having on that day broken up and floated out to sea. The winter began in October and has been the severest known for many years. The bay was entirely covered with ice from two to three feet thick. Wladivostock is said to be improving, though slowly, and there are signs of an attempt at road-making.

THE *Japan Gazette* learns that as an encouragement to the producers of tea, silk, and cocoons, it has been resolved by the Government to hold an exhibition of these articles in the Machigwai-sho at Yokohama. Foreigners and native dealers are not to be allowed to exhibit, as the scheme is devised entirely for the benefit of producers and manufacturers.

GOLD-BEARING quartz has lately been discovered at Sarugoye in the Yamato district of Japan.

THE *Golos* reports the discovery in the district of Perejaslav, Pultowa Government, of 370 flint arrow-heads, a number of bones of men and animals, fragments of earthenware, and bronze objects.

THE *Annual Report* of the Goole Scientific Society for 1878-9 records satisfactory progress. As the result of a rule admitting ladies, twenty-one have joined the society.

THE Hull Literary and Philosophical Society, to judge from the Report for 1878-9, seems to be doing a great variety of good work in their district by means of lectures, papers, classes, &c. The Society is in a flourishing condition as to members and funds, and has added, during the session, a Microscopical and a Geological Section.

THE additions to the Zoological Society's Gardens during the past week include two Red and Yellow Macaws (*Ara chloroptera*), a Red and Blue Macaw (*Ara macao*), a Blue and Yellow Macaw (*Ara ararauna*) from South America, a Common Trumpeter (*Psophia crepitans*) from Demerara, presented by Mr. Chas. Fricker; two Golden Eagles (*Aquila chrysaetos*) from Scotland, presented by Mrs. A. H. Browne; a Geoffroy's Marmoset (*Midas geoffroyi*) from Panama, purchased; a Stanley Crane (*Tetrapteryx paradisea*) from South Africa, received in exchange; a Bay Antelope (*Cephalophus dorsalis*) from West Africa, deposited; a Peacock Pheasant (*Polyplectron chinquis*), two Black-crested Cardinals (*Gubernatrix cristatella*), two Geoffroy's Doves (*Peristera geoffroyi*), bred in the Gardens.

THE EOZÖON CANADENSE

WE have received the following communications on this subject:—

I shall be glad to be allowed to ask your readers to suspend their judgment in the matter of *Eozöon*, until the appearance of the full and complete memoir, based (I venture to say) upon investigations far more comprehensive than those of Prof. Moebius—upon which I am now engaged, in conjunction with my friend Prof. Dawson. But as the production of this memoir will necessarily be a work of considerable time, on account of the elaborate illustrations it will require, I would now offer the following brief remarks on that part of Prof. Moebius's discussion which relates to the so-called "canal-system."

Among the numerous beautiful figures which Prof. Moebius has given of sections of the "canal-system," there is not one which represents what I described and figured, when I last wrote on the subject (*Ann. of Nat. Hist.*, June, 1874, plate xix.), as "what appears to be the typical mode of its distribution." Nor is this brought out in any of the small number of figures which Prof. Moebius gives of the internal casts obtained by decalcification. Now to any one who will picture to himself how imperfect would be any conception he could form of the ramification of a tree, by taking a number of sections of its stem and system of branches through different planes, it must be obvious that "internal casts," in relief, when well preserved, will give a representation of the canal-system, which must be much truer than any conception can be that is based on a comparison of sections only; and that, in fact, it is only when the sections are interpreted by such solid models, that the real forms and relations of these "canal-systems" can be made out.

Having been kindly furnished by Prof. Dawson some months ago, with a large amount of new material, consisting of numerous specimens of *Eozöon*, obtained from different localities and in different states of mineralisation, I am now able to assert with

confidence that the peculiar distribution described and figured by me from the actual specimens (one of which has been in Prof. Moebius's own possession) five years ago,¹ is the regular and characteristic "canal-system" of *Eozöon*. For my cabinet now contains hundreds of examples of it, both in transparent sections and in the solid models obtained by decalcification; and these last, in partially "dolomitised" specimens of *Eozöon*, show the following singular peculiarities, which do not seem to have fallen under Prof. Moebius's observation. When a band of dolomite runs through the calcite layers, (1) the "canal systems" in its neighbourhood are very commonly filled with dolomite, instead of with serpentine; (2) in one and the same canal-system, some of the branches are often filled with dolomite, and others with serpentine; while (3) individual branches are often partly filled with one mineral and partly with the other.

How these facts can be explained, except by the *pre-existence* or a system of canals in the calcareous layers into which these minerals have penetrated, I must confess myself unable to conceive; and that they thus afford demonstrative evidence of a structure which cannot be otherwise than organic is not merely my own opinion, but that of such accomplished petrologists as Prof. Geikie, who has been for some years engaged in the microscopic study of the metamorphic rocks of Scotland, and Prof. Bonney, who has been similarly studying the Cornish serpentine.

Whether, when taken in connection with the general structure of the organism, these "canal-systems" indicate its *Foraminiferal* affinities is, of course, an altogether different matter. To Prof. Moebius the difference seems greater than the resemblance; but it is noteworthy that his comparisons are limited to types examined by himself, and do not extend to *Calcarina*, in whose "canal-system" Dr. Dawson and I recognise the nearest approach to that of *Eozöon*. To myself, as to the late Prof. Max Schultze,² the resemblance seems greater than the difference. And as the several "canal-systems" of *Nummulina*, *Polystomella*, *Calcarina*, *Tinoporos*, and *Cycloclypeus* (all originally worked out by myself) differ from each other in plan, I cannot regard it as a valid argument against the foraminiferal affinities of *Eozöon* that its canal-system has a plan of its own. Surely Prof. Moebius would not deny the foraminiferal characters to any new recent type that the *Challenger* or any other collection may yield, if it should show a plan of canal-system different from any yet known, and approximating to that of *Eozöon*.

That in its general plan of growth (to which the distribution of the canal-system is intimately related) *Eozöon* differs from all recent *Foraminifera* at present known cannot be regarded as a proof of its non-foraminiferal character by any who have fully studied the very wide range of forms which that group comprehends, including the numerous indefinite "arenaceous" types, whose import is only now beginning to be understood by those who have the best opportunities of studying them.

I would suggest this further consideration: If we are to relegate to the mineral kingdom every supposed fossil that does not conform to any known existing type, we must expunge not only *Eozöon*, but *Stromatopora*—to say nothing of many other fossils whose place no one has yet been able to assign with certainty. Now, is Prof. Moebius prepared to say that *Stromatopora* is a "pseudomorph," because one zoologist thinks it a coral, another a sponge, and another a foraminifer? On his method of "differences" it is clearly neither one of these; and must, as he says of *Eozöon*, be either shut out of the animal kingdom altogether, or be made to constitute a sub-kingdom in itself. To myself it appears more philosophical to suppose that such "archaic" types combined in themselves characters which were afterwards specialised as those of distinct groups. And following this clue, I find in the chambered structure of *Eozöon*, and in its general relations to the canal-system traversing its calcareous layers, points of essential conformity to the group of *Foraminifera*, which seem to me far to outweigh the differences of detail by which Prof. Moebius has been led to the opposite conclusion.

I limit myself to this special point, because an excellent general criticism of Prof. Moebius's memoir, from the pen of Dr. Dawson, has already appeared in the *American Journal of Science*; and I hope that as you have given so much prominence to the views put forth by Prof. Moebius, you will do Dr. Dawson

¹ I think it rather hard that an early diagram of mine should be cited, and made the subject of adverse criticism, while those more recent representations of actual structures are ignored.

² I have been informed on good authority that Prof. Max Schultze left behind him for publication an elaborate and beautifully illustrated memoir on *Eozöon*, arguing for its foraminiferal character on account of the resemblance of its "canal-system" to that of existing types.